# BeAGLE Status

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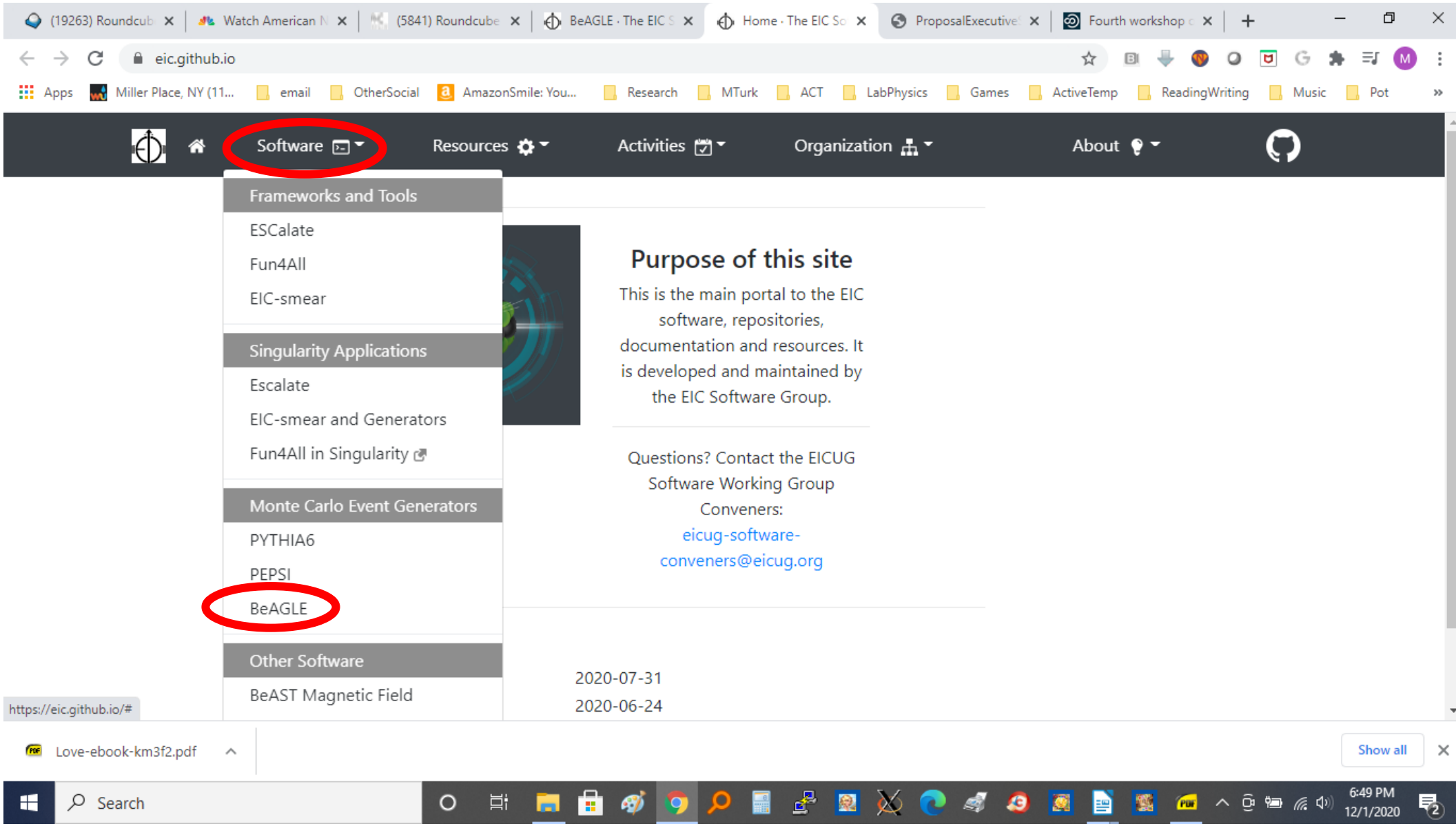
# BeAGLE documentation moved

- Kolja ported the BeAGLE documentation over to github: eic.github.io/software/beagle.html
  - At some point https://wiki.bnl.gov/eic/index.php/BeAGLE will change to just point to github instead.
- It is a little more effort to change than the wiki, but I was able to do it with instructions from Kolja.
  - I don't really like the push request model...
- Plan to update & keep up to date. Especially the control cards!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Purpose of this site
This is the main portal to the EIC software, repositories, documentation and resources. It is developed and maintained by the EIC Software Group.
Questions? Contact the EICUG Software Working Group Conveners:
eicug-software-conveners@eicug.org
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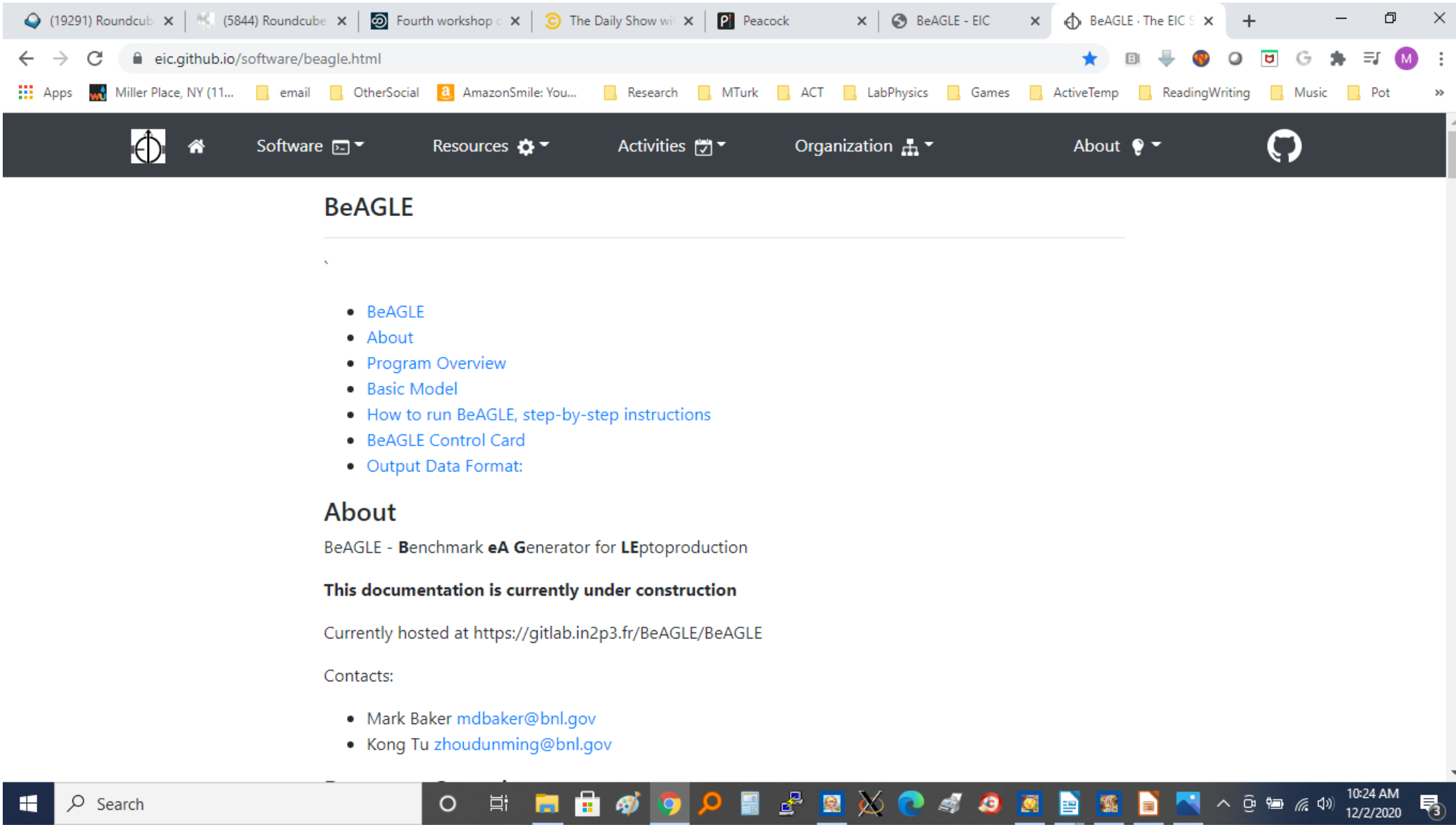
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How to run BeAGLE, step-by-step instructions
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Output Data Format:
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BeAGLE - Benchmark eA Generator for LEptoproduction
This documentation is currently under construction
Currently hosted at https://gitlab.in2p3.fr/BeAGLE/BeAGLE
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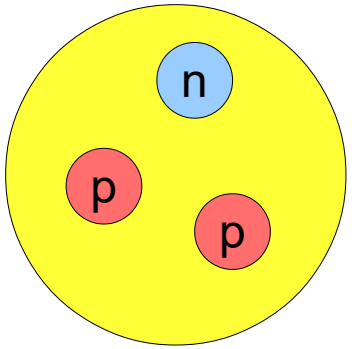
# BeAGLE description for the paper

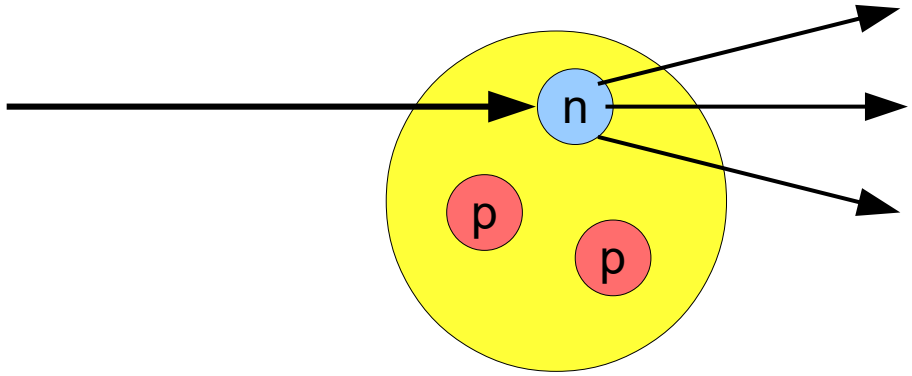
- Control card description
  - In code comments (DPM_INIT), on web & in paper
  - How to handle two levels?
    - commonly changed user parameters (e.g. A, Z, $\tau_0$)
    - vs. expert: non-standard or old kinematic choices, inaccurate DPMJET version of Fermi momentum...
- Approximate application of Fermi momentum for struck nucleon (including A=2,3).
- Multinucleon shadowing description.
- Glauber in BeAGLE (including 3D).

# 3He in BeAGLE / DPMJET




**DPMJET Nuclear model is:**
**3 on-mass-shell nucleons sitting in a potential.**

**M($^3$He)= 2.80839 GeV**
**M(p+p+n)=2.81611 GeV**
**8 MeV binding energy**




**The "remnant" 4-momentum is calculated by momentum conservation.**
**E.g. for energy, take $E_{eTRF}$+M($^3$He) and subtract out the Pythia KS==1 particles.**
**Typically, this leaves $E_{pp} < 2M_p$.**

# What not to talk about yet.

- PyQM – or perhaps mention in passing?
  - No good solution available for where to put the radiated energy:
    - Throw it away – big energy nonconservation
    - Excite the nucleus – too much – hangs FLUKA, won't match data.
    - Single big gluon – mostly just replacing quark jets with gluon jets – pretty subtle effect.
    - Multigluons – work in progress (abandoned?)
- RAPGAP – not ready for primetime
- GCF??

# Technical ToDo

- Fix $^{3}$He kinematics (actually A=3).
  - Also fix crash in n-struck $^{3}$He unless it is fixed automatically by the kinematic fix...
- GCF implementation
  - Debug GCF-QE with full INC etc.
    - Currently just works w/ skipping INC.
  - Implement GCF-DIS

# EIC R&D progress report coming soon.

- Big question is FY2022 plans for funding my involvement (or not!).
- Probably won't discuss it in the written report, but it will come up during the talk (Late Jan.?).